

REGULAR MONTHLY WEATHER SURVEY

MONTHLY WEATHER REVIEW

VOLUME 81

1953



U. S. DEPARTMENT OF COMMERCE • WEATHER BUREAU

Science
QC
983
.A27

REGULAR MONTHLY WEATHER SURVEY

Charts I-III and VI-XV in each issue of the Review, January to December, inclusive; Charts IV and V, A and B, in each issue January-March and November-December, inclusive:
Chart I. A. Average Temperature at Surface. B. Departure of Average Temperature from the Normal.
Chart II. Total Precipitation.
Chart III. A. Departure of Precipitation from Normal. B. Percentage of Normal Precipitation.
Chart IV. Total Snowfall.
Chart V. A. Percentage of Normal Snowfall. B. Depth of Snow on Ground.
Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset. B. Percentage of Normal Sky Cover Between Sunrise and Sunset.
Chart VII. A. Percentage of Possible Sunshine. B. Percentage of Normal Sunshine.
Chart VIII. Average Daily Values of Solar Radiation and Percentage of Normal.
Chart IX. Tracks of Centers of Anticyclones at Sea Level.
Chart X. Tracks of Centers of Cyclones at Sea Level.
Chart XI. Average Sea Level Pressure and Surface Windroses. Departure of Average Pressure from Normal.
Chart XII. Average Dynamic Height and Average Temperature at 850-mb. Pressure Surface, and Resultant Winds at 1,500 Meters.
Chart XIII. Average Dynamic Height and Average Temperature at 700-mb. Pressure Surface, and Resultant Winds at 3,000 Meters.
Chart XIV. Average Dynamic Height and Average Temperature at 500-mb. Pressure Surface, and Resultant Winds at 5,000 Meters.
Chart XV. Average Dynamic Height and Average Temperature at 300-mb. Pressure Surface, and Resultant Winds at 10,000 Meters.

In addition to the Charts I-XV the survey consists of two monthly articles:

1. A discussion of the month's weather, including an interpretation of Charts I-XV in relation to mean circulation patterns of the Northern Hemisphere.
2. A discussion of an outstanding weather situation of the month, including an analysis and interpretation of the meteorological features shown by synoptic weather charts.

NOTICE

The Weather Bureau desires that the MONTHLY WEATHER REVIEW shall be a medium of publication for contributions within the field, but such publication is not to be construed as official approval of the views expressed.

CORRECTIONS

Volume 80:

- p. 82: In column 2 in text beneath table 1, total March 1952 precipitation at Boston should be 11.00 in. The next sentence should read: "The 24-hour total of 3.10 in. for the period ending about 1900 EST, March 30, is 0.06 in. greater than any previous 24-hour total in March."
p. 204: In footnote 3, ratio for making frequencies taken by 10° squares at 30° N. comparable to those taken at 40° N. should be $\cos 40^\circ / \cos 30^\circ$, not $\sin 30^\circ / \sin 40^\circ$.

Volume 81:

- p. 35: In figure 3, isopleth at center over intersection of cross lines should be labeled "8" instead of "9".
p. 37: Sentence beginning in line 1 should read: "they indicate that wind waves and swell do have the characteristics of the surface waves."
p. 170: Maps in figures 3 and 4 should be interchanged. Map labeled figure 4 is for 1500 GMT, June 8, 1953.

Sunder
8t.

MONTHLY WEATHER REVIEW

SUBJECT AND AUTHOR INDEX OF THE MONTHLY WEATHER REVIEW, 1953, VOL. 81

An aid for forecasting the minimum temperature at Denver, Colo. (13 figs.) C. G. Gilbert. 233-245.

An alignment chart for atmospheric transmission of solar radiation. (1 fig.) Frank Gifford, Jr. 11.

Analysis of winds, wind waves, and swell over the sea to the east of Japan during the typhoon of September 26, 1935. (6 figs.) H. Arakawa and K. Suda. 31-37.

Anticyclones:

The anticyclone and record low temperatures in central and southeastern United States, April 19-22, 1953. (14 figs.) W. Malkin and G. C. Holzworth. 121-129.

Blocking Highs over the eastern North Atlantic Ocean and western Europe. (14 figs.) R. A. Sanders. 67-73.

The polar outbreak in mid-December [1953]. (14 figs.) Lloyd W. Chamberlain and Charlotte L. Roe. 397-404.

The weather and circulation of August 1953—Featuring an analysis of anticyclogenesis accompanying record heat and drought. (12 figs.) William H. Klein. 246-254.

ARAKAWA, H.:

and K. Suda. Analysis of winds, wind waves, and swell over the sea to the east of Japan during the typhoon of September 26, 1935. (6 figs.) 31-37

ARMSTRONG, HARRY:

Forecasting tornadoes in Georgia. (10 figs.) 290-298.

Atmospheric transmission:

An alignment chart for atmospheric transmission of solar radiation. (1 fig.) Frank Gifford, Jr. 11.

Blocking Highs over the eastern North Atlantic Ocean and western Europe. (14 figs.) R. A. Sanders. 67-73.

BROWN, H. E.:

and C. F. Thomas. Rainfall in maritime tropical air over the Midwest, July 16-18, 1953. (14 figs.) 210-216.

California:

Estimating precipitation at San Francisco from concurrent variables. (9 figs.) Donald L. Jorgensen. 101-110.

Canada:

Variability of annual precipitation in Canada. (1 fig.) Richmond W. Longley. 131-134.

CAUSEY, OBIE Y.:

The distribution of summer showers over small areas. (2 figs.) 111-114.

CHAMBERLAIN, LLOYD C.:

and Charlotte L. Roe. The polar outbreak in mid-December [1953]. (14 figs.) 397-404.

Climatology:

Blocking Highs over the eastern North Atlantic Ocean and western Europe. (14 figs.) R. A. Sanders. 67-73.

Comparative local noon temperature and humidity data for the United States. (2 figs.) W. P. Day. 332-335.

The distribution of summer showers over small areas. (2 figs.) Obie Y. Causey. 111-114.

Forecasting tornadoes in Georgia. (10 figs.) Harry Armstrong. 290-298.

Frequency variation of snow depths in the Missouri and Upper Mississippi Basins. Vance A. Myers. 162.

Normal monthly change in sea level pressure and in the gradient of effective solar radiation. (2 figs.) Miles F. Harris. 193-194.

Record snowfall of April 14-15, 1921 at Silver Lake, Colo. (2 figs.) J. L. H. Paulhus. 38-40.

A study of hurricane tracks for forecasting purposes. (12 figs.) José A. Colón. 53-66.

Singularities in weather at Walla Walla, Wash. as related to the index of zonal westerlies. (2 figs.) Edwin J. Rebman. 386-387.

Summary of tornadoes in Colorado, Wyoming, and New Mexico. (4 figs.) A. W. Cook. 74-76.

Variability of annual precipitation in Canada. (1 fig.) Richmond W. Longley. 131-134.

COLLINS, G. C.:

and J. C. Thompson. A generalized study of precipitation forecasting. Part 1: Computation of precipitation from the fields of moisture and wind. (3 figs.) 91-100.

COLÓN, JOSÉ A.:

A study of hurricane tracks for forecasting purposes. (12 figs.) 53-66.

Colorado:

An aid for forecasting the minimum temperature at Denver, Colo. (13 figs.) C. G. Gilbert. 233-245.

Summary of tornadoes in Colorado, Wyoming, and New Mexico. (4 figs.) A. W. Cook. 74-76.

Comparative local noon temperature and humidity data for the United States. (2 figs.) W. P. Day. 332-335.

Computing insolation by empirical methods. J. Neumann. 330-331.

COOK, A. W.:

Summary of tornadoes in Colorado, Wyoming, and New Mexico. (4 figs.) 74-76.

SUBJECT AND AUTHOR INDEX

Cyclogenesis:

Cyclogenesis aloft over southwestern United States, October 17-22, 1953. (11 figs.) Clarence L. Kibler and Earl F. Robinson. 342-347.

Cyclogenesis and floods associated with stagnant cold Low, March 25-30, 1953. (15 figs.) Charles M. Lennahan and George C. Holzworth. 82-89.

Some aspects of cyclogenesis in the Great Lakes region September 11-12, 1953. (14 figs.) Abe Rosenbloom and Earl F. Robinson. 309-317.

Cyclones:

Analysis of winds, wind waves, and swell over the sea to the east of Japan during the typhoon of September 26, 1935. (6 figs.) H. Arakawa and K. Suda. 31-37.

Cyclogenesis aloft over southwestern United States, October 17-22, 1953. (11 figs.) Clarence L. Kibler and Earl F. Robinson. 342-347.

Cyclogenesis and floods associated with stagnant cold Low, March 25-30, 1953. (15 figs.) Charles M. Lennahan and George C. Holzworth. 82-89.

Hurricane Barbara, 1953. (20 figs.) R. P. James and C. F. Thomas. 255-265.

Hurricanes of 1952. (2 figs.) Grady Norton. 12-15.

Hurricanes of 1953. (1 fig.) Grady Norton. 388-391.

The northern Gulf Low of February 14, 1953. (11 figs.) Alan H. Jones and Charlotte L. Roe. 47-52.

Some aspects of cyclogenesis in the Great Lakes region, September 11-12, 1953. (14 figs.) Abe Rosenbloom and Earl F. Robinson. 309-317.

A study of hurricane tracks for forecasting purposes. (12 figs.) José A. Colón. 53-66.

Tornadoes associated with hurricanes—As illustrated by Franconia, Va. tornado, September 1, 1952. (6 figs.) W. Malkin and J. G. Galway. 299-303.

DAY, STANLEY:

Horizontal convergence and the occurrence of summer precipitation at Miami, Florida. (7 figs.) 155-161.

DAY, W. P.:

Comparative local noon temperature and humidity data for the United States. (2 figs.) 332-335.

The distribution of summer showers over small areas. (2 figs.) Obie Y. Causey. 111-114.

Drought:

The weather and circulation of June 1953—The second successive June with record-breaking drought and heat. (8 figs.) Jay S. Winston. 163-168.

The weather and circulation of July 1953. (6 figs.) Harry F. Hawkins, Jr. 204-209.

Drought—Continued

The weather and circulation of August 1953—Featuring an analysis of anticyclogenesis accompanying record heat and drought. (12 figs.) William H. Klein. 246-254.

The weather and circulation of September 1953—Another dry month in the United States. (7 figs.) William H. Klein. 304-308.

The weather and circulation of October 1953—The beginning of drought alleviation. (6 figs.) Harry F. Hawkins, Jr. 336-341.

Estimating precipitation at San Francisco from concurrent variables. (9 figs.) Donald L. Jorgensen. 101-110.

Evaporation:

Readjustment of a front after cooling by precipitation. (2 figs.) H. Wexler. 152-154.

Some effects of the evaporation of widespread precipitation on the production of fronts and on changes in frontal slopes and motions. (27 figs.) Vincent J. Oliver and George C. Holzworth. 141-151.

An extraordinary rainfall centered at Hallett, Okla. (25 figs.) George A. Lott. 1-10.

Floods:

Cyclogenesis and floods associated with stagnant cold Low, March 25-30, 1953. (15 figs.) Charles M. Lennahan and George C. Holzworth. 82-89.

Heavy rainfall during mid-January [1953] along the Pacific Coast. (9 figs.) Grover D. Hughes and Charlotte L. Roe. 20-25.

The weather and circulation of January 1953. (6 figs.) Kenneth E. Smith. 16-19.

Florida:

Horizontal convergence and the occurrence of summer precipitation at Miami, Florida. (7 figs.) Stanley Day. 155-161.

Forecasting:

An aid for forecasting the minimum temperature at Denver, Colo. (13 figs.) C. G. Gilbert. 233-245.

Forecasting tornadoes in Georgia. (10 figs.) Harry Armstrong. 290-298.

Forecasting winter precipitation 36 to 48 hours in advance at Des Moines, Iowa—An experiment using the prognostic chart as a data source. (17 figs.) Sidney Teweles, Jr. and Albert L. Forst. 357-367.

A generalized study of precipitation forecasting Part 1: Computation of precipitation from the fields of moisture and wind. (3 figs.) J. C. Thompson and G. O. Collins. 91-100.

A generalized study of precipitation forecasting Part 2: A graphical computation of precipitation. (14 figs.) P. M. Kuhn. 222-232.

High level vertical motion in relation to tropical rainfall. (3 figs.) Banner I. Miller. 319-325.

Forecasting—Continued

Horizontal convergence and the occurrence of summer precipitation at Miami, Florida. (7 figs.) Stanley Day. 155-161.

A new concept of skill score for rating quantitative forecasts. Edward M. Vernon. 326-329.

Remarks on "On thunderstorm forecasting in the central United States." (1 fig.) [Letter to Editor.] Albert L. Forst. 40-42.

A study of hurricane tracks for forecasting purposes. (12 figs.) José A. Colón. 53-66.

A suggested technique for quantitative precipitation forecasting. (5 figs.) Jerome Spar. 217-221.

The use of probability statements in extended forecasting. (8 figs.) Walter G. Leight. 349-356.

FORST, ALBERT L.:

Remarks on "On thunderstorm forecasting in the central United States." (1 fig.) [Letter to Editor.] 40-42.

and Sidney Teweles, Jr. Forecasting winter precipitation 36 to 48 hours in advance at Des Moines, Iowa—An experiment using the prognostic chart as a data source. (17 figs.) 357-367.

FOSKETT, LAURENCE W.:

and Norman B. Foster, William R. Thickstun, Rex C. Wood. Infrared absorption hygrometer. (8 figs.) 267-277.

FOSTER, NORMAN B.:

and Laurence W. Foskett, William R. Thickstun, Rex C. Wood. Infrared absorption hygrometer. (8 figs.) 267-277.

FOSTER, ROBERT I.:

and Earl F. Robinson. The strong jet over the southwestern Plains States, November 24-25, 1953. (8 figs.) 374-378.

Frequency variation of snow depths in the Missouri and Upper Mississippi Basins. Vance A. Myers. 162.

Fronts:

Readjustment of a front after cooling by precipitation. (2 figs.) H. Wexler. 152-154.

Some effects of the evaporation of widespread precipitation on the production of fronts and on changes in frontal slopes and motions. (27 figs.)

Vincent J. Oliver and George C. Holzworth. 141-151.

GALWAY, J. G.:

and W. Malkin. Tornadoes associated with hurricanes—As illustrated by Franconia, Va. tornado, September 1, 1952. (6 figs.) 299-303.

General circulation:

Blocking Highs over the eastern North Atlantic Ocean and western Europe. (14 figs.) R. A. Sanders. 67-73.

The weather and circulation of January 1953. (6 figs.) Kenneth E. Smith. 16-19.

The weather and circulation of February 1953. (5 figs.) Kenneth E. Smith. 43-46.

General circulation—Continued

The weather and circulation of March 1953—Including a review of this year's mild winter. (7 figs.) William H. Klein. 77-81.

The weather and circulation of April 1953—A cold, stormy month with a low index circulation. (8 figs.) William H. Klein. 115-120.

The weather and circulation of May 1953—One of the worst tornado months on record. (5 figs.) Jay S. Winston. 135-140.

The weather and circulation of June 1953—The second successive June with record-breaking drought and heat. (8 figs.) Jay S. Winston. 163-168.

The weather and circulation of July 1953. (6 figs.) Harry F. Hawkins, Jr. 204-209.

The weather and circulation of August 1953—Featuring an analysis of dynamic anticyclogenesis accompanying record heat and drought. (12 figs.) William H. Klein. 246-254.

The weather and circulation of September 1953—Another dry month in the United States. (7 figs.) William H. Klein. 304-308.

The weather and circulation of October 1953—The beginning of drought alleviation. (6 figs.) Harry F. Hawkins, Jr. 336-341.

The weather and circulation of November 1953—A month of contrasting regimes. (5 figs.) Jay S. Winston. 368-373.

The weather and circulation of December 1953—A month of fast westerly flow. (4 figs.) Jay S. Winston. 392-396.

A generalized study of precipitation forecasting. Part 1: Computation of precipitation from the fields of moisture and wind. (3 figs.) J. C. Thompson and G. O. Collins. 91-100.

A generalized study of precipitation forecasting. Part 2: A graphical computation of precipitation. (14 figs.) P. M. Kuhn. 222-232.

Georgia:

Forecasting tornadoes in Georgia. (10 figs.) Harry Armstrong. 290-298.

GIFFORD, FRANK, JR.:

An alignment chart for atmospheric transmission of solar radiation. (1 fig.) 11.

A study of low level air trajectories at Oak Ridge, Tenn. (13 figs.) 179-192.

GILBERT, C. G.:

An aid for forecasting the minimum temperature at Denver, Colo. (13 figs.) 233-245.

HARRIS, MILES F.:

Normal monthly change in sea level pressure and in the gradient of effective solar radiation. (2 figs.) 193-194.

SUBJECT AND AUTHOR INDEX

- HAWKINS, HARRY, JR.:**
- The weather and circulation of July 1953. (6 figs.) 204-209.
 - The weather and circulation of October 1953—The beginning of drought alleviation. (6 figs.) 336-341.
 - Heavy rainfall during mid-January [1953] along the Pacific Coast. (9 figs.) Grover D. Hughes and Charlotte L. Roe. 20-25.
 - The heavy snowstorm of January 28-30, 1953 at the eastern end of Lake Ontario. (3 figs.) Ernest C. Johnson and Conrad P. Mook. 26-30.
 - High level vertical motion in relation to tropical rainfall. (3 figs.) Banner I. Miller. 319-325.
- HOLZWORTH, GEORGE C.:**
- and Charles F. Thomas. Low level warm air advection, June 8-9, 1953. (23 figs.) 169-178.
 - and Charles M. Lennahan. Cyclogenesis and floods associated with stagnant cold Low, March 25-30, 1953. (15 figs.) 82-89.
 - and Vincent J. Oliver. Some effects of the evaporation of widespread precipitation on the production of fronts and on changes in frontal slopes and motions. (27 figs.) 141-151.
 - and W. Malkin. The anticyclone and record low temperatures in central and southeastern United States, April 19-22, 1953. (14 figs.) 121-129.
 - Horizontal convergence and the occurrence of summer precipitation at Miami, Florida. (7 figs.) Stanley Day. 155-161.
- HUGHES, GROVER D.:**
- and Charlotte L. Roe. Heavy rainfall during mid-January [1953] along the Pacific Coast. (9 figs.) 20-25.
- Humidity:**
- Comparative local noon temperature and humidity data for the United States. (2 figs.) W. P. Day. 332-335.
 - Infrared absorption hygrometer. (8 figs.) Laurence W. Foskett, Norman B. Foster, William R. Thickstun, and Rex C. Wood. 267-277.
- Hurricanes:**
- Hurricane Barbara, 1953. (20 figs.) R. P. James and C. F. Thomas. 255-265.
 - Hurricanes of 1952. (2 figs.) Grady Norton. 12-15.
 - Hurricanes of 1953. (1 fig.) Grady Norton. 388-391.
 - A study of hurricane tracks for forecasting purposes. (12 figs.) José A. Colón. 53-66.
 - Tornadoes associated with hurricanes—As illustrated by Franconia, Va. tornado, September 1, 1952. (6 figs.) W. Malkin and J. G. Galway. 299-303.
- Hygrometer:**
- Infrared absorption hygrometer. (8 figs.) Laurence W. Foskett, Norman B. Foster, William R. Thickstun, and Rex C. Wood. 267-277.
 - Infrared absorption hygrometer. (8 figs.) Laurence W. Foskett, Norman B. Foster, William R. Thickstun, and Rex C. Wood. 267-277.
- Instruments:**
- Infrared absorption hygrometer. (8 figs.) Laurence W. Foskett, Norman B. Foster, William R. Thickstun, and Rex C. Wood. 267-277.
- Iowa:**
- Forecasting winter precipitation 36 to 48 hours in advance at Des Moines, Iowa—An experiment using the prognostic chart as a data source. (17 figs.) Sidney Teweles, Jr. and Albert L. Forst. 357-367.
- JAMES, R. P.:**
- and C. F. Thomas. Hurricane Barbara, 1953. (20 figs.) 255-265.
- Jet stream:**
- The strong jet over the southwestern Plains States, November 24-25, 1953. (8 figs.) Robert I. Foster and Earl F. Robinson. 374-378.
- JOHNSON, ERNEST C.:**
- and Conrad P. Mook. The heavy snowstorm of January 28-30, 1953 at the eastern end of Lake Ontario. (3 figs.) 26-30.
- JONES, ALAN H.:**
- and Charlotte L. Roe. The northern Gulf Low of February 14, 1953. (11 figs.) 47-52.
- JORGENSEN, DONALD L.:**
- Estimating precipitation at San Francisco from concurrent meteorological variables. (9 figs.) 101-110.
- KIBLER, CLARENCE L.:**
- and Earl F. Robinson. Cyclogenesis aloft over southwestern United States, October 17-22, 1953. (11 figs.) 342-347.
- KLEIN, WILLIAM H.:**
- The weather and circulation of March 1953—Including a review of this year's mild winter. (7 figs.) 77-81.
 - The weather and circulation of April 1953—A cold stormy month with a low index circulation. (8 figs.) 115-120.
 - The weather and circulation of August 1953—Featuring an analysis of dynamic anticyclogenesis accompanying record heat and drought. (12 figs.) 246-254.
 - The weather and circulation of September 1953—Another dry month in the United States. (7 figs.) 304-308.
- KUHN, P. M.:**
- A generalized study of precipitation forecasting. Part 2: A graphical computation of precipitation. (14 figs.) 222-232.
- LEIGHT, WALTER G.:**
- The use of probability statements in extended forecasting. (8 figs.) 349-356.

- LENNAHAN, CHARLES M.:
and George C. Holzworth. Cyclogenesis and floods associated with stagnant cold Low, March 25-30, 1953. (15 figs.) 82-89.
- LEWIS, WILLIAM:
and Porter J. Perkins. Recorded pressure distribution in the outer portion of a tornado vortex. (6 figs.) 379-385.
- LONGLEY, RICHMOND W.:
Variability of annual precipitation in Canada. (1 fig.) 131-134.
- LOTT, GEORGE A.:
An extraordinary rainfall centered at Hallett, Okla. (25 figs.) 1-10.
The unparalleled Thrall, Texas rainstorm. (14 figs.) 195-203.
Low level warm air advection, June 8-9, 1953. (23 figs.) George C. Holzworth and Charles F. Thomas. 169-178.
- MALKIN, W.:
and G. C. Holzworth. The anticyclone and record low temperatures in central and southeastern United States, April 19-22, 1953. (14 figs.) 121-129.
and J. G. Galway. Tornadoes associated with hurricanes—As illustrated by Franconia, Va. tornado, September 1, 1952. (6 figs.) 299-303.
- Micrometeorology:
A study of low level air trajectories at Oak Ridge, Tenn. (13 figs.) Frank Gifford, Jr. 179-192.
- MILLER, BANNER I.:
High level vertical motion in relation to tropical rainfall. (3 figs.) 319-325.
- Mississippi Basin:
Frequency variation of snow depths in the Missouri and Upper Mississippi Basins. Vance A. Myers. 162.
- Missouri Basin:
Frequency variation of snow depths in the Missouri and Upper Mississippi Basins. Vance A. Myers. 162.
- MOOK, CONRAD P.:
and Ernest C. Johnson. The heavy snowstorm of January 28-30, 1953, at the eastern end of Lake Ontario (3 figs.) 26-30.
- MYERS, VANCE A.:
Frequency variation of snow depths in the Missouri and Upper Mississippi Basins. 162.
- NEUMANN, J.:
Computing insolation by empirical methods. 330-331.
- A new concept of skill score for rating quantitative forecasts. Edward M. Vernon. 326-329.
- New Mexico:
Summary of tornadoes in Colorado, Wyoming, and New Mexico. (4 figs.) A. W. Cook. 74-76.
- New York:
The heavy snowstorm of January 28-30, 1953 at the eastern end of Lake Ontario. (3 figs.) Ernest C. Johnson and Conrad P. Mook. 26-30.
Normal monthly change in sea level pressure and in the gradient of effective solar radiation. (2 figs.) Miles F. Harris. 193-194.
The northern Gulf Low of February 14, 1953. (11 figs.) Alan H. Jones and Charlotte L. Roe. 47-52.
- NORTON, GRADY:
Hurricanes of 1952. (2 figs.) 12-15.
Hurricanes of 1953. (1 fig.) 388-391.
- Oklahoma:
An extraordinary rainfall centered at Hallett, Okla. (25 figs.) George A. Lott. 1-10.
- OLIVER, VINCENT J.:
and George C. Holzworth. Some effects of the evaporation of widespread precipitation on the production of fronts and on changes in frontal slopes and motions. (27 figs.) 141-151.
- PAULHUS, J. L. H.:
Record snowfall of April 14-15, 1921 at Silver Lake, Colo. (2 figs.) 38-40.
- PERKINS, PORTER J.:
and William Lewis. Recorded pressure distribution in the outer portion of a tornado vortex. (6 figs.) 379-385.
- The polar outbreak in mid-December [1953]. (14 figs.) Lloyd W. Chamberlain and Charlotte L. Roe. 397-404.
- Precipitation:
The distribution of summer showers over small areas (2 figs.) Obie Y. Causey. 111-114.
Estimating precipitation at San Francisco from concurrent variables. (9 figs.) Donald L. Jorgenson. 101-110.
An extraordinary rainfall centered at Hallett, Okla. (25 figs.) George A. Lott. 1-10.
Forecasting winter precipitation 36 to 48 hours in advance at Des Moines, Iowa—An experiment using the prognostic chart as a data source. (1 fig.) Sidney Teweles, Jr. and Albert L. Forst. 357-367.
A generalized study of precipitation forecasting
Part 1: Computation of precipitation from the fields of moisture and wind. (3 figs.) J. C. Thompson and G. O. Collins. 91-100.
A generalized study of precipitation forecasting
Part 2: A graphical computation of precipitation (14 figs.) P. M. Kuhn. 222-232.
Heavy rainfall during mid-January [1953] along the Pacific Coast. (9 figs.) Grover D. Hughes and Charlotte L. Roe. 20-25.
The heavy snowstorm of January 28-30, 1953 at the eastern end of Lake Ontario. (3 figs.) Ernest C. Johnson and Conrad P. Mook. 26-30.

SUBJECT AND AUTHOR INDEX

Precipitation—Continued

- High level vertical motion in relation to tropical rainfall. (3 figs.) Banner I. Miller. 319-325.
- Horizontal convergence and the occurrence of summer precipitation at Miami, Florida. (7 figs.) Stanley Day. 155-161.
- Low level warm air advection, June 8-9, 1953. (23 figs.) Charles F. Thomas and George C. Holzworth. 169-178.
- Rainfall in maritime tropical air over the Midwest, July 16-18, 1953. (14 figs.) H. E. Brown and C. F. Thomas. 210-216.
- Readjustment of a front after cooling by precipitation. (2 figs.) H. Wexler. 153-154.
- Record snowfall of April 14-15, 1921 at Silver Lake, Colo. (2 figs.) J. L. H. Paulhus. 38-40.
- Singularities in weather at Walla Walla, Wash., as related to the index of zonal westerlies. (2 figs.) Edwin J. Rebman. 386-387.
- Some effects of the evaporation of widespread precipitation on the production of fronts and on changes in frontal slopes and motions. (27 figs.) Vincent J. Oliver and George C. Holzworth. 141-151.
- A suggested technique for quantitative precipitation forecasting. (5 figs.) Jerome Spar. 217-221.
- The unparalleled Thrall, Texas rainstorm. (14 figs.) George A. Lott. 195-203.
- Variability of annual precipitation in Canada. (1 fig.) Richmond W. Longley. 131-134.

Pressure:

- Normal monthly change in sea level pressure and in the gradient of effective solar radiation. (2 figs.) Miles F. Harris. 193-194.
- Pressure wave observations in the central Midwest, 1952. (18 figs.) D. T. Williams. 278-289.
- Recorded pressure distribution in the outer portion of a tornado vortex. (6 figs.) William Lewis and Porter J. Perkins. 379-385.

Radiation, solar:

- An alignment chart for atmospheric transmission of solar radiation. (1 fig.) Frank Gifford, Jr. 11.
- Computing insolation by empirical methods. J. Neumann. 330-331.
- Normal monthly change in sea level pressure and in the gradient of effective solar radiation. (2 figs.) Miles F. Harris. 193-194.

Rainfall in maritime tropical air over the Midwest, July 16-18, 1953. (14 figs.) H. E. Brown and C. F. Thomas. 210-216.

Readjustment of a front after cooling by precipitation. (2 figs.) H. Wexler. 152-154.

REBMAN, EDWIN J.:

- Singularities in weather at Walla Walla, Wash. as related to the index of zonal westerlies. (2 figs.) 386-387.

Record snowfall of April 14-15, 1921 at Silver Lake, Colo. (2 figs.) J. L. H. Paulhus. 38-40.

Recorded pressure distribution in the outer portion of a tornado vortex. (6 figs.) William Lewis and Porter J. Perkins. 379-385.

Remarks on "On thunderstorm forecasting in the central United States." (1 fig.) [Letter to Editor] Albert L. Forst. 40-42.

ROBINSON, EARL F.:

- and Abe Rosenbloom. Some aspects of cyclogenesis in the Great Lakes region, September 11-12, 1953. (14 figs.) 309-317.
- and Clarence L. Kibler. Cyclogenesis aloft over southwestern United States, October 17-22, 1953. (11 figs.) 342-347.
- and Robert I. Foster. The strong jet over the southwestern Plains States, November 24-25, 1953. (8 figs.) 374-378.

ROE, CHARLOTTE L.:

- and Alan H. Jones. The northern Gulf Low of February 14, 1953. (11 figs.) 47-52.
- and Grover D. Hughes. Heavy rainfall during mid-January [1953] along the Pacific Coast. (9 figs.) 20-25.
- and Lloyd W. Chamberlain. The polar outbreak in mid-December [1953]. (14 figs.) 397-404.

ROSENBLUM, ABE:

- and Earl F. Robinson. Some aspects of cyclogenesis in the Great Lakes region, September 11-12, 1953. (14 figs.) 309-317.

SANDERS, R. A.

- Blocking Highs over the eastern North Atlantic Ocean and western Europe. (14 figs.) 67-73.

Showers:

- The distribution of summer showers over small areas. (2 figs.) Obie Y. Causey. 111-114.

Singularities in the weather at Walla Walla, Wash. as related to the index of zonal westerlies. (2 figs.) Edwin J. Rebman. 386-387.

Skill Score:

- A new concept of skill score for rating quantitative forecasts. Edward M. Vernon. 326-329.

SMITH, KENNETH E.:

- The weather and circulation of January 1953. (6 figs.) 16-19.

- The weather and circulation of February 1953. (5 figs.) 43-46.

Snow:

- Frequency variation of snow depths in the Missouri and Upper Mississippi Basins. Vance A. Myers. 162.

- The heavy snowstorm of January 28-30, 1953 at the eastern end of Lake Ontario. (3 figs.) Ernest C. Johnson and Conrad P. Mook. 26-30.

- Record snowfall of April 14-15, 1921 at Silver Lake, Colo. (2 figs.) J. L. H. Paulhus. 38-40.

Some aspects of cyclogenesis in the Great Lakes region, September 11-12, 1953. (14 figs.) Abe Rosenbloom and Earl F. Robinson. 309-317.

Some effects of the evaporation of widespread precipitation on the production of fronts and on changes in frontal slopes and motions. (27 figs.) Vincent J. Oliver and George C. Holzworth. 141-151.

SPAR, JEROME:

A suggested technique for quantitative precipitation forecasting. (5 figs.) 217-221.

The strong jet over the southwestern Plains States, November 24-25, 1953. (8 figs.) Robert I. Foster and Earl F. Robinson. 374-378.

A study of hurricane tracks for forecasting purposes. (12 figs.) José A. Colón. 53-66.

A study of low level air trajectories at Oak Ridge, Tenn. (13 figs.) Frank Gifford, Jr. 179-192.

SUDA, K.:

and H. Arakawa. Analysis of winds, wind waves, and swell over the sea to the east of Japan during the typhoon of September 26, 1953. (6 figs.) 31-37.

A suggested technique for quantitative precipitation forecasting. (5 figs.) Jerome Spar. 217-221.

Summary of tornadoes in Colorado, Wyoming, and New Mexico. (4 figs.) A. W. Cook. 74-76.

Swell, ocean:

Analysis of winds, wind waves, and swell over the sea to the east of Japan during the typhoon of September 26, 1953. (6 figs.) H. Arakawa and K. Suda. 31-37.

Temperature:

An aid for forecasting the minimum temperature at Denver, Colo. (13 figs.) C. G. Gilbert. 233-245.

The anticyclone and record low temperatures in central and southeastern United States, April 19-22, 1953. (14 figs.) W. Malkin and G. C. Holzworth. 121-129.

Comparative local noon temperature and humidity data for the United States. (2 figs.) W. P. Day. 332-335.

Low level warm air advection, June 8-9, 1953. (23 figs.) Charles F. Thomas and George C. Holzworth. 169-178.

The polar outbreak in mid-December [1953]. (14 figs.) Lloyd W. Chamberlain and Charlotte L. Roe. 397-404.

Singularities in weather at Walla Walla, Wash. as related to the index of zonal westerlies. (2 figs.) Edwin J. Rebman. 386-387.

The weather and circulation of March 1953—Including a review of this year's mild winter. (7 figs.) William H. Klein. 77-81.

Temperature—Continued

The weather and circulation of April 1953—A cold stormy month with a low index circulation. (8 figs.) William H. Klein. 115-120.

The weather and circulation of June 1953—The second successive June with record-breaking drought and heat. (8 figs.) Jay S. Winston. 163-168.

Tennessee:

A study of low level air trajectories at Oak Ridge, Tenn. (13 figs.) Frank Gifford, Jr. 179-192.

TEWELES, SIDNEY, JR.:

and Albert L. Forst. Forecasting winter precipitation 36 to 48 hours in advance at Des Moines, Iowa—An experiment using the prognostic chart as a data source. (17 figs.) 357-367.

Texas:

The unparalleled Thrall, Texas rainstorm. (14 figs.) George A. Lott. 195-203.

THICKSTUN, WILLIAM R.:

and Laurence W. Foskett, Norman B. Foster, Rex C. Wood. Infrared absorption hygrometer. (8 figs.) 267-277.

THOMAS, CHARLES F.:

and George C. Holzworth. Low level warm air advection, June 8-9, 1953. (23 figs.) 169-178.

and H. E. Brown. Rainfall in maritime tropical air over the Midwest, July 16-18, 1953. (14 figs.) 210-216.

and R. P. James. Hurricane Barbara, 1953. (20 figs.) 255-265.

THOMPSON, J. C.:

and G. O. Collins. A generalized study of precipitation forecasting. Part 1: Computation of precipitation from the fields of moisture and wind. (3 figs.) 91-100.

Thunderstorms:

Remarks on "On thunderstorm forecasting in the central United States." (1 fig.) [Letter to Editor] Albert L. Forst. 40-42.

Tornadoes:

Forecasting tornadoes in Georgia (10 figs.) Harry Armstrong. 290-298.

Recorded pressure distribution in the outer portion of a tornado vortex. (6 figs.) William Lewis and Porter J. Perkins. 379-385.

Summary of tornadoes in Colorado, Wyoming, and New Mexico. (4 figs.) A. W. Cook. 74-76.

Tornadoes associated with hurricanes—As illustrated by Franconia, Va. tornado, September 1, 1952. (6 figs.) W. Malkin and J. G. Galway. 299-303.

The weather and circulation of May 1953—One of the worst tornado months on record. (5 figs.) Jay S. Winston. 135-140.

Trajectories:

A study of low level air trajectories at Oak Ridge, Tenn. (13 figs.) Frank Gifford, Jr. 179-192.

Typhoons:

Analysis of winds, wind waves, and swell over the sea to the east of Japan during the typhoon of September 26, 1935. (6 figs.) H. Arakawa and K. Suda. 31-37.

The unparalleled Thrall, Texas rainstorm. (14 figs.) George A. Lott. 195-203.

The use of probability statements in extended forecasting (8 figs.) Walter G. Leight. 349-356.

Variability of annual precipitation in Canada. (1 fig.) Richmond W. Longley. 131-134.

VERNON, EDWARD M.:

A new concept of skill score for rating quantitative forecasts. 326-329.

Verification:

A new concept of skill score for rating quantitative forecasts. Edward M. Vernon. 326-329.

The use of probability statements in extended forecasting. (8 figs.) Walter G. Leight. 349-356.

Vertical motion:

A generalized study of precipitation forecasting. Part 1: Computation of precipitation from the fields of moisture and wind. (3 figs.) J. C. Thompson and G. O. Collins. 91-100.

A generalized study of precipitation forecasting. Part 2: A graphical computation of precipitation. (14 figs.) P. M. Kuhn. 222-232.

High level vertical motion in relation to tropical rainfall. (3 figs.) Banner I. Miller. 319-325.

Low level warm air advection, June 8-9, 1953. (23 figs.) Charles F. Thomas and George C. Holzworth. 169-178.

Virginia:

Tornadoes associated with hurricanes—As illustrated by Franconia, Va. tornado, September 1, 1952. (6 figs.) W. Malkin and J. G. Galway. 299-303.

Washington:

Singularities in weather at Walla Walla, Wash., as related to the index of zonal westerlies. (2 figs.) Edwin J. Rebman. 386-387.

Waves, ocean:

Analysis of winds, wind waves, and swell over the sea to the east of Japan during the typhoon of September 26, 1935. (6 figs.) H. Arakawa and K. Suda. 31-37.

Weather, U. S., 1953:

The anticyclone and record low temperatures in central and southeastern United States, April 19-22, 1953. (14 figs.) W. Malkin and G. C. Holzworth. 121-129.

Weather, U. S., 1953—Continued

Cyclogenesis aloft over southwestern United States, October 17-22, 1953. (11 figs.) Clarence L. Kibler and Earl F. Robinson. 342-347.

Cyclogenesis and floods associated with stagnant cold Low, March 25-30, 1953. (15 figs.) Charles M. Lennahan and George C. Holzworth. 82-89. Heavy rainfall during mid-January along the Pacific Coast. (9 figs.) Grover D. Hughes and Charlotte L. Roe. 20-25.

The heavy snowstorm of January 28-30, 1953 at the eastern end of Lake Ontario. (3 figs.) Ernest C. Johnson and Conrad P. Mook. 26-30.

Hurricane Barbara, 1953. (20 figs.) R. P. James and C. F. Thomas. 255-265.

Low level warm air advection, June 8-9, 1953 (23 figs.) George C. Holzworth and Charles F. Thomas. 169-178.

The northern Gulf Low of February 14, 1953. (11 figs.) Alan H. Jones and Charlotte L. Roe. 47-52.

The polar outbreak in mid-December. (14 figs.) Lloyd W. Chamberlain and Charlotte L. Roe. 397-404.

Rainfall in maritime tropical air over the Midwest, July 16-18, 1953. (14 figs.) H. E. Brown and C. F. Thomas. 210-216.

Some aspects of cyclogenesis in the Great Lakes region, September 11-12, 1953. (14 figs.) Abe Rosenbloom and Earl F. Robinson. 309-317.

Some effects of the evaporation of widespread precipitation on the production of fronts and on changes in frontal slopes and motions. (27 figs.) Vincent J. Oliver and George C. Holzworth. 141-151.

The strong jet over the southwestern Plains States, November 24-25, 1953. (8 figs.) Robert L. Foster and Earl F. Robinson. 374-378.

The weather and circulation of January 1953. (6 figs.) Kenneth E. Smith. 16-19.

The weather and circulation of February 1953. (5 figs.) Kenneth E. Smith. 43-46.

The weather and circulation of March 1953—Including a review of this year's mild winter. (7 figs.) William H. Klein. 77-81.

The weather and circulation of April 1953—A cold stormy month with a low index circulation. (8 figs.) William H. Klein. 115-120.

The weather and circulation of May 1953—One of the worst tornado months on record. (5 figs.) Jay S. Winston. 135-140.

The weather and circulation of June 1953—The second successive June with record-breaking drought and heat. (8 figs.) Jay S. Winston. 163-168.

The weather and circulation of July 1953. (6 figs.) Harry F. Hawkins, Jr. 204-209.

Weather, U. S., 1953—Continued

The weather and circulation of August 1953—Featuring an analysis of dynamic anticyclogenesis accompanying record heat and drought. (12 figs.) William H. Klein. 246–254.

The weather and circulation of September 1953—Another dry month in the United States. (7 figs.) William H. Klein. 304–308.

The weather and circulation of October 1953—The beginning of drought alleviation. (6 figs.) Harry F. Hawkins, Jr. 336–341.

The weather and circulation of November 1953—A month of contrasting regimes. (5 figs.) Jay S. Winston. 368–373.

The weather and circulation of December 1953—A month of fast westerly flow. (4 figs.) Jay S. Winston. 392–396.

WEXLER, H.:

Readjustment of a front after cooling by precipitation. (2 figs.) 152–154.

WILLIAMS, D. T.:

Pressure wave observations in the central Midwest, 1952. (18 figs.) 278–289.

Winds:

Analysis of winds, wind waves, and swell over the sea to the east of Japan during the typhoon of September 26, 1955. (6 figs.) H. Arakawa and K. Suda. 31–37.

Horizontal convergence and the occurrence of summer precipitation at Miami, Florida. (7 figs.) Stanley Day. 155–161.

Winds—Continued

Low level warm air advection, June 8–9, 1953. (23 figs.) Charles F. Thomas and George C. Holzworth. 169–178.

The strong jet over the southwestern Plains States, November 24–25, 1953. (8 figs.) Robert I. Foster and Earl F. Robinson. 374–378.

A study of low level air trajectories at Oak Ridge, Tenn. (13 figs.) Frank Gifford, Jr. 179–192.

WINSTON, JAY S.:

The weather and circulation of May 1953—One of the worst tornado months on record. (5 figs.) 135–140.

The weather and circulation of June 1953—The second successive June with record-breaking drought and heat. (8 figs.) 163–168.

The weather and circulation of November 1953—A month of contrasting regimes. (5 figs.) 368–373.

The weather and circulation of December 1953—A month of fast westerly flow. (4 figs.) 392–396.

WOOD, REX C.:

and Laurence W. Foskett, Norman B. Foster, William R. Thickstun. Infrared absorption hygrometer. (8 figs.) 267–277.

Wyoming:

Summary of tornadoes in Colorado, Wyoming, and New Mexico. (4 figs.) A. W. Cook. 74–76.

Zonal index:

Singularities in the weather at Walla Walla, Wash., as related to the index of zonal westerlies. (2 figs.) Edwin J. Rebman. 386–387.